

## **ABSTRACT**

An apparatus is provided for quantitatively measuring combinations of magnetic particles combined with analytes whose amount or other characteristic quality is to be determined. The magnetic particles are complexed with the analytes to be determined and are excited in a magnetic field. The magnetizations of the magnetic particles are thereby caused to oscillate at the excitation frequency in the manner of a dipole to create their own fields. These fields are inductively coupled to at least one sensor such as sensing coils fabricated in a gradiometer configuration. The output signals from the sensing coils are appropriately amplified and processed to provide useful output indications.